SUBJECT INDEX

A

ACE
  see Angiotensin-converting enzyme
Acetylcholine
  cimetidine and, 220
  distribution of markers for, 367
  histamine-induced inhibitory response and, 238
  olfactory sensory neurons and, 334
  release of
    histamine and, 233
Acetylcholine receptor, 383-406
  acetylcholine affinity for, 417
  agonist binding and, 392-95
  antagonist binding and, 392-95
  binding sites of, 395-96
  electrophysiological action of, 390-92
  ion channels and, 405-6
  molecular analysis of, 256
  molecule of, 386-92
  noncompetitive blockers of, 398-401
  postsynaptic membrane and, 384-86
  subunits in, 401-5
  sulfhydryl groups in, 396-98
Acetylcholinesterase
  acetylcholine receptor and, 384
  corticostriate fibers and, 367-68
Achatina fulica
  learning in, 448-49
ACTH
  see Adrenocorticotropin
Adenosine deaminase
  histamine receptors and, 223
Adenosine diphosphate
  brain metabolism and, 63-64
Adenosine receptors
  in vitro labeling autoradiography and, 37
Adenosine triphosphate
  brain metabolism and, 63-68
Adenylate cyclase
  activation of, 110
  ciliary
    odorant stimulation of, 349
  histamine and, 218, 222, 226
Adenylcyclase
  transduction in insect sensilla and, 135
ADP
  see Adenosine diphosphate
Adrenal medulla
  DNA hybridization and, 292-93
Adrenergic receptors
  in vitro labeling autoradiography and, 35
  olfactory epithelial tissue and, 334
α-Adrenergic receptors
  astemizole and, 219
ß-Adrenergic receptors
  cimetidine and, 220
Adrenocorticotropin
  proopiomelanocortin precursor and, 281
Age
  Alzheimer's disease and, 501-2
Agonists
  histamine receptors and, 215-21
AI
  see Artificial intelligence
Akinesia
  aimed arm movements and, 161
Aliphatic alcohols
  acetylcholine receptor and, 398
Alkaline ribonuclease
  Alzheimer's disease and, 502
Aluminum intoxication
  Alzheimer's disease and, 499-500
Alzheimer's disease, 489-506
  aluminum intoxication and, 499-500
  amyloid deposition in, 498-99
  clinical manifestations of, 489-91
  etiological factors in, 501-4
  neuronal systems in, 491-95
Amacrine cells
  derivation of, 177
γ-Aminobutyrate
  binding sites for
    cimetidine and, 220
  histamine antagonists and, 219
γ-Aminobutyric acid
  Alzheimer's disease and, 494
Aminopeptidases
  enkephalin and, 420-23
  neuropeptide inactivation and, 420-23
Aminopyridines
  potassium channels and, 256
Amitriptyline
  histamine receptors and, 218
Ammonium iodide
  acetylcholine receptor and, 392
Amygdala
  Alzheimer's disease and, 493
  striatum and, 372-73
Amyloid
  Alzheimer's disease and, 498-99, 503-4
Amyloid angiopathy, 499
Analeptic response
  histamine receptors and, 221
Analgesia
  histamine and, 211
Angiotensin-converting enzyme
  autoradiography and, 50
  enkephalin inactivation and, 423
Angiotensin II receptors
  in vitro labeling autoradiography and, 37
Anosmia, 339
Antagonists
  histamine receptors and, 215-21
Anterior cingulate cortex, 371-72
Antheraea pernyi
  olfactory adaptation in, 139
  sensillum lymph of, 134
Antheraea polyphemus
  antennae of
    esterases of, 128
    odor absorption and, 123-24
  intensity coding and, 138
  olfactory adaptation in, 139
  olfactory receptors of
    electrical responses in, 132
  pheromone-binding protein of, 127
  pheromone inactivation in, 129
  receptor potentials of, 130-31
  sensilla of
    properties of, 132-33

sensillum lymph of, 134
stimulus transport in, 125-26
Antibodies
receptor mapping and, 46
Antipsychotic agents
enkephalin and, 295
Aperture problem, 14-15
Apis mellifera
learning in, 440-43
Aplysia californica
histamine in, 210
learning in, 459-69
Aplysia spp.
histidine distribution in, 236-37
Apomorphine
histamine antagonists and, 219
Arachidonate
cyclic GMP formation and, 225
release of
histamine and, 225
Arm movements, 147-67
aimed, 147-49
characteristics of, 149-54
brain lesions and, 161-63
development in infancy, 154-56
neuronal recording and, 163-66
planning of, 158-61
visual guidance of, 156-58
Arrestin
cyclic GMP cascade and, 108-10
Artificial intelligence
human brain and, 1-25
Ascorbate
collagen synthesis and, 318
myelination in culture and, 317
Aspartate
histamine antagonists and, 219
Aspartic acid
uptake sites of
autoradiography and, 50
Associative learning, 437
Astemizole
histamine receptors and, 215
receptor affinities of, 219
Astrocytes
nonneuronal cell ensheathment and, 321
Ataxia
aimed arm movements and, 161
ATP
see Adenosine triphosphate
Autoradiography
central nervous system enzymes and, 50
electron microscopic, 47-48
gray-white quenching and, 43-45
in vitro labeling, 33-41
in vivo labeling, 31-32
methods of, 31-41
quantitative, 41-43
receptor mapping and, 27-50
Axons
see also specific type

B

Barbiturate receptors
in vitro labeling autoradiography and, 37
Basal forebrain cholinergic system
Alzheimer's disease and, 492-93
Basal ganglia
histamine binding sites in, 222
Basal ganglia circuits, 357-77
anterior cingulate, 371-72
clinical implications of, 373-75
dorsolateral prefrontal, 369-71
lateral orbitofrontal, 371
motor, 362-68
oculomotor, 368-69
subsidiary, 373
Basal ganglia-thalamocortical circuit, 359-61
Basal lamina
deficiencies in, 318-20
epithelial cells and, 321-23
Schwann cells and, 305-6, 313-14
Bathorhodopsin
formation of, 103
Benzenediazonium fluorobate
acetylcholine receptor and, 392
Benzodiazepine receptors
distribution of, 30
in vitro labeling autoradiography and, 37
in vivo labeling autoradiography and, 33
olfactory epithelial tissue and, 334
Benzodiazepines
binding sites for
cimetidine and, 220
histamine antagonists and, 219
Bestatin
neuropeptide inactivation and, 421-22
Bicuculline
cerebral acidosis and, 66-67
status epilepticus and, 66
Binocular competition
eye-input segregation and, 194-99
Biofeedback
aimed arm movements and, 161
Biogenic amines
in brain tissue, 209-10
Blocking, 438
Blood vessels
brain
histamine in, 214
Bombesin
isolation of, 284
Bombesin-gastrin-releasing peptides, 283-84
Bombesin receptors
in vitro labeling autoradiography and, 37
Bombykol
adsorption of, 124
Bombyx mori and, 127-28, 134-35
enzymatic degradation of, 127-28
Bombyx mori
antennae of
odor absorption and, 123-24
bombykol and, 127-28, 134-35
intensity coding and, 138
stimulus transport in, 126
Bradykinin
metalloendopeptidases and, 425
Bradykinin receptors
in vitro labeling autoradiography and, 37
Brain
DNA hybridization and, 293-97
histamine turnover in, 209
see also Human brain, Mammalian brain
Brain information processing
basis of, 280
Brain lesions
aimed arm movements and, 161-63
Brainstem
Alzheimer's disease and, 491-92
Bromoacetylcholine
acetylcholine receptor and, 392
Buccal ganglia
feeding behavior and, 445-48
α-Bungarotoxin
acetylcholine receptor and, 394
ionic channels and, 256
Burimamide
histamine-induced depolarization and, 237

C

Caffeine
  histamine antagonists and, 220
Calcitonin gene
  coding sequences for, 284-85
Calcitonin-gene related peptide, 285
Calcium
  protein kinase C activation and, 225
Calcium channels
  autoradiography and, 50
  Drosophila mutants and, 260-63
Calcium ions
  cytosolic levels of
    regulation of, 97-98
  rod outer segments and, 88-89
Carbamylcholine
  acetylcholine receptor and, 392-93, 398
Carbohydrate metabolism
  Alzheimer's disease and, 503
Carbon-13
  nuclear magnetic resonance spectroscopy and, 69-72
Carbon-14
  autoradiography and, 42-45
Carboxypeptidase E
  autoradiography and, 50
Carcinomas
  calcitonin mRNA in, 284-85
Cardiovascular regulation
  histamine and, 211
Carnosine
  olfactory sensory neurons and, 334
Catecholamines
  brain
    reserpine and, 295
Catecholamine storage sites
  autoradiography and, 50
Caudate nucleus
  corticostriate projections to, 362
  eye field neurons and, 368-69
  hypometabolism in
    Huntington's disease and, 375
  projections to globus pallidus, 370
cDNA
  in situ hybridization of, 278
  preparation of, 278
cDNA clones
  Drosophila mRNA,268-69
cDNA library, 278
Central nervous system enzymes
  autoradiography and, 50
Central nervous system receptors
  in vitro labeling autoradiography and, 35-38
  in vivo labeling autoradiography and, 33
CER
  see Conditioned emotional response
Cerebellum
  histamine binding sites in, 222
Cerebral acidosis
  bicuculline and, 66-67
  potassium cyanide and, 66
Cerebral circulation
  histamine and, 211
Cerebral cortex
  histaminergic fibers in, 229
  lesions of
    aimed arm movements and, 161
Cerebrospinal fluid
  neurotransmitters in, 29
CGRP
  see Calcitonin gene-related peptide
p-Chlorophenylalanine
  brain enkephalin and, 296
Chlorpheniramine
  histamine-induced inhibitory response and, 238
Chlorpromazine
  acetylcholine receptor and, 398
Cholecystokinin receptors
  in vitro labeling autoradiography and, 37
Cholera toxin
  enkephalin and, 293
  olfactory G-protein and, 349
  transducin and, 110-11
Cholesterol
  acetylcholine receptor and, 386
Cholinergic receptors
  in vitro labeling autoradiography and, 35
  in vivo labeling autoradiography and, 33
  olfactory epithelial tissue and, 334
  positron emission tomography and, 47
Choline uptake sites
  autoradiography and, 50
Chorionic somatomammotropin gene
  sequence homology of, 283
Chromaffin cells
  peptides and, 293
Cilia
  motility of
    dinein and, 332
  olfactory, 346-47
Cimetidine
  histamine-induced excitations and, 231
  histamine-induced inhibitory responses and, 238
  histamine receptors and, 215, 219, 220
  physiologic effects of, 220-21
Cingulate cortex
  anterior, 371-72
Circular dichroism
  acetylcholine receptor and, 387
Classical conditioning, 437, 464-68
Clonidine
  invertebrate photoreceptors and, 456
Cloning
  neuropeptide precursors and, 277
  types of, 278
Cobratoxin
  acetylcholine receptor and, 394
Collagen
  basal flattening and, 324
  Schwann cell basal lamina and, 313-14
  Schwann cell secretion of, 307-9
  secretion of
    perturbation of, 318
  synthesis of
    ascorbate and, 318
Color perception
  retinex theory and, 19-21
Compound 48/80
  microvessel histamine levels and, 214
Computational vision
  empirical vision research and, 23-24
  neurosciences and, 24-25
Computerized tomography
  Alzheimer's disease and, 491
Concanavalin A
  olfactory response and, 344
Conditioned emotional response, 439-40
Conditioned inhibition, 439
Conditioning
  classical, 437, 464-68
  first-order, 438
  instrumental, 437
  operant, 468-69
  second-order, 438
Coriolis forces
  aimed arm movements and, 147
Correlation techniques
  visual motion measurement and, 13-14
Correspondence
  human vision and, 16-17

Corticospinal tract
aimed arm movements and, 166
Corticostriate fibers
acetylcholinesterase and, 367-68
Corticotropin-releasing factor
precursor for, 286
proopiomelanocortin and, 291
receptors
in vitro labeling autoradiography and, 37
CRF
see Corticotropin-releasing factor
CS
see Chorionic somatomammotropin
Cyclic AMP
A. californica and, 461-62
histamine receptors and, 218, 222-26
olfactory transduction and, 348-49
tyrosine hydroxylase and, 293
Cyclic GMP
cone outer segments and, 112-13
cytosolic levels of
regulation of, 97-98
histamine receptors and, 222-26
hydrolysis and synthesis of
light pulses and, 94-97
rod outer segments and, 89
sodium channels and, 90-94
vision and, 87-114
Cyclic GMP phosphodiesterase
activation of, 107-8
inhibition of, 107-8
Cyclooxygenase
inhibitors of
cyclic GMP formation and, 225
Cysteine residues
olfactory response and, 344
Cysteinylcysteine
disulfide bonds in, 395
Cytosol
cyclic GMP levels in
regulation of, 97-98

D

Decomposition theory
visual image processing and, 10-11
Dementia pugilistica, 504
Depression
dibenzazepines and, 211
Dexamethasone
growth hormone mRNA and, 291
Diacylglycerol
protein kinase C activation and, 225-26
Dibenzazepines
depression and, 211
Diethyldithiocarbamate
luteinizing hormone releasing hormone and, 429
Dihydromorphine
binding sites for
cimetidine and, 220
histamine antagonists and, 219
5,6-Dihydroxytryptamine
histidine decarboxylase and, 227
5,7-Dihydroxytryptamine
brain enkephalin and, 296
Diketopiperazine
prolactin release and, 429-30
Dimaprit
histamine receptors and, 221
Dinein
ciliary motility and, 332
Dipeptidyl carboxypeptidase
enkephalin inactivation and, 423-25
Diphenhydramine
histamine-induced excitations and, 231
histamine-induced inhibitory responses and, 238
Disparlure
metabolism on *Lymantria dispar* antennae, 128
DNA fragments
hybridization analysis of, 278
DNA probes
neuropeptide biosynthesis and, 277
DNA sequences
brain-specific genes and, 289
polyprotein processing and, 279
Docosahexaenoic acid
T. californica electrolyte lipids and, 386
Dodecenyl acetate, 128
DOPA
histidine decarboxylase and, 227
Dopamine
histamine-induced inhibitory responses and, 238
proopiomelanocortin and, 292
uptake of
autoradiography and, 50
histamine antagonists and, 219
Dopamine receptors
aging process and, 47
in vitro labeling autoradiography and, 35
in vivo labeling autoradiography and, 33
Dorsal raphe
striatum and, 373
Dorsolateral prefrontal cortex, 369-71
Double-opponent cells
color perception and, 20
Down's syndrome
Alzheimer's disease and, 502
Doxepin
histamine binding sites and, 221
Drinking behavior
histamine and, 211
Drosophila melanogaster
ionic channels in, 255-73
learning in, 469-73
Drosophila mutants
bang-sensitive, 258
excitability, 257-58, 270-72
leg-shaking, 257-58
nap, 269-70
shaker, 258-69
temperature-sensitive, 258
Drug action
receptor mapping and, 28
Drug receptors
binding ligands for, 31
Dynorphin
prodynorphin and, 281-83
Dystrophic mice
Schwann cell ensheathment and, 318-20

E

Edge detection
procedure for, 5
visual processing and, 3-9
EGF
see Epidermal growth factor
Elbow joint
aimed arm movements and, 147, 152
Electromyography
aimed arm movements and, 148-49, 156, 161, 163
Electron microscopic autoradiography
receptor mapping and, 47-48
Electron microscopy
basal lamina production and, 323
nerve fiber ensheathment and, 305
receptor mapping and, 46
Electrooculography
aimed arm movements and, 156
Electrophorus spp.
acetylcholine receptor of, 389

Emesis
histamine and, 211
ß-Endorphin
proopiomelanocortin precursor and, 281
ß-neo-Endorphin
prodynorphin and, 281-83
Endothelial cells
substratum configuration and, 323
Enkephalin
adrenal medullary, 292-93
aminopeptidases and, 420
antipsychotic agents and, 295
distribution of markers for, 367
enzymatic inactivation of, 419-26
Enkephalin convertase
autoradiograpy and, 50
Enkephalin peptides
encoding of, 281
Entactin
Schwann cells and, 313-14, 317
Entorhinal cortex
Alzheimer's disease and, 493
ventral striatum and, 372
Enzymes
see specific type
Epidermal growth factor
prolactin and, 290-91
Epinephrine
adenylate cyclase activation and, 110
Epithelia
olfactory, 330-32
cultures of, 347
receptors in, 334
Epithelial cells
basal lamina and, 321-23
substratum configuration and, 323-24
Ergocryptine
proopiomelanocortin mRNA and, 292
Esterases
Antheraea polyphemus and, 128
N-Ethylmaleimide
olfactory response and, 344
Extracellular matrix
Schwann cell function and, 314-21
Eye movements
saccadic, 369

F

Fatty acids
T. marmorata electrolyte lipids and, 386
Feeding behavior
conditioning and, 468
control of, 447-48
histamine and, 211
nerve cells and, 445
Fenfluramine
brain enkephalin and, 296
Fetuin
myelination in culture and, 317
Fibroblasts
fibronectin secretion and, 307
viral budding polarity and, 322
Fibronectin
basal flattening and, 324
fibroblast secretion of, 307
Schwann cell basal lamina and, 314
Finger joints
aimed arm movements and, 147, 152
First-order conditioning, 438
Fluoromethylhistidine
histidine decarboxylase and, 214
Forskolin
enkephalin and, 293
Fourier transform analysis
acetylcholine receptor and, 388

G

GABA receptors
in vitro labeling autoradiography and, 37
muscimol and, 30
Galactocerebroside
Schwann cells and, 311
Ganglion cells
see Retinal ganglion cells
Gene conversion
neuropeptides and, 284
Gene families
neuropeptides and, 283-84
Gene sequencing
calcitonin and, 284-85
neuropeptide precursors and, 277
opioid peptide precursors and, 283
Gene transcription
in vitro nuclear transcription run-off and, 279
Gene transfer
DNA-mediated, 279
Geniculocortical axons
eye-input segregation and, 192
Genomic library, 278
Geraniol
Antheraea pernyi olfactory receptors and, 139
GH
see Growth hormone
GHRF
see Growth hormone releasing factor
Glicentin, 286
Globus pallidus
caudate nucleus projections to, 370
neuronal activity in, 365-66
putamen input to, 363
Glucagon
adenylate cyclase activation and, 110
precursor of, 286
Glucocorticoids
neuroendocrine peptide regulation and, 291
Glutamate
histamine antagonists and, 219
Glutamate dehydrogenase
hypothalamic, 230
Glutamate receptors
in vitro labeling autoradiography and, 37
Glutamic acid uptake sites
autoradiography and, 50
Glycerol 3-phosphorylcholine
phosphodiester signal in brain and, 66
Glycerol 3-phosphorylethanolamine
phosphodiester signal in brain and, 66
Glycine receptors
in vitro labeling autoradiography and, 37
G proteins
olfactory, 349
transducin and, 110-12
Granulovacular degeneration
Alzheimer's disease and, 498
Gravitational forces
aimed arm movements and, 147, 153
Growth hormone gene
pituitary and, 290-91
sequence homology of, 283
Growth hormone releasing factor
precursor for, 286
Guanine triphosphate
ciliary adenylate cyclase and, 349
Guanylate cyclase
cyclic GMP formation and, 225

H

Habituation
A. californica and, 459-63
Haloperidol
enkephalin and, 295

proopiomelanocortin mRNA and, 296
Helix pomatia
histamine transport in, 239
Heparan sulfate proteoglycan
Schwann cells and, 313-14, 317, 324
Hermissenda crassicornis
learning in, 452-59
Heteronuclear decoupling
nuclear magnetic resonance spectroscopy and, 79-80
Hexadecadienol
pheromone-binding protein and, 127
Hexadecadienyl acetate
half life of, 129-30
Hexadecanol
adsorption of, 124
Hexadecanyl acetate
pheromone-binding protein and, 127
Hippocampus
Alzheimer's disease and, 493
histidine decarboxylase activity in, 210
somatostatin cell bodies in, 278-79
ventral striatum and, 372
Hirano bodies
Alzheimer's disease and, 497-98
Hirudo medicinalis
learning in, 449-50
Histamine, 209-40
agonists
phospholipid metabolism and, 225-26
antagonists
anticonvulsant effects of, 220
physiologic effects of, 219-21
EC-50 values of, 216
invertebrate nervous system and, 235-40
mammalian neurons and, 230-35
receptors
cimetidine and, 220
classification of, 215-21
in vitro labeling autoradiography and, 37
second messengers and, 221-27
turnover in mammalian brain, 211-14
Histamine methyltransferase
inhibition of, 219
Histaminergic pathways
in mammalian brain, 227-30
Histidine
distribution in *Aplysia*, 236-37
Histidine decarboxylase
activity in hippocampus, 210
fluoromethylhistidine and, 214
histamine synthesis and, 209
hypothalamic, 227-30
neurotoxins and, 227
Histrionicotoxin
acetylcholine receptor and, 398
Homonuclear decoupling
nuclear magnetic resonance spectroscopy and, 76-78
Honey bees
learning in, 440-43
Human brain
artificial intelligence and, 1-25
autoradiography and, 43-45
chemical organization of receptor mapping and, 28-29
nuclear magnetic resonance spectroscopy and, 61-83
Huntington's disease
basal ganglia circuits and, 373-75
Hybridization
in situ, 278-79
neuropeptides and, 287-97
solution, 278
Hydrogen
nuclear magnetic resonance spectroscopy and, 72-76
spectra, 73, 75, 77
6-Hydroxydopamine
brain catecholamines and, 295
histidine decarboxylase and, 227
cis-Hydroxyproline
collagen secretion and, 318
5-Hydroxytryptamine
Alzheimer's disease and, 492
histidine decarboxylase and, 227
receptor
astemizole and, 219
release of
histamine and, 233
uptake of
histamine antagonists and, 219
5-Hydroxytryptophan decarboxylase
histidine decarboxylase and, 227
Hypoglycemia
brain metabolism and, 65
Hypothalamus
cell bodies in, 278
CGRP mRNA in, 285
glutamate dehydrogenase in, 230
histamine binding sites in, 222
histamine turnover in, 212
histidine decarboxylase in, 227-30
luteinizing hormone releasing hormone and, 426-29
prodynorphin mRNA in, 294
proopiomelanocortin mRNA in, 294
Hypothermia
reserpine-induced histamine antagonists and, 220
Hypotonia
aimed arm movements and, 161
Hypoxia
brain metabolism and, 65

I

Imidazolacetic acid
histamine deamination and, 212
Imidazole
rod outer segment and, 96
Immunohistochemistry
receptor mapping and, 45-46
Impromidine
histamine receptors and, 217, 221, 227
Inertial forces
aimed arm movements and, 147
Infancy
aimed arm movements and, 150, 154-56
Inhibition
conditioned, 439
Inorganic phosphate
brain metabolism and, 63-68
Inositol phospholipids
histamine receptors and, 222-26
Insect antennae
olfaction and, 123-24
Insect olfactory organs, 122-26
stimulus transport and, 124-26
Insect olfactory receptors
chemo-electrical transduction in, 121-40
intensity coding and, 136-38
Insect sensilla
see Sensilla
In situ hybridization, 278-79
Instrumental conditioning, 437
Insulin receptors
in vitro labeling autoradiography and, 37
Insulin shock
brain metabolism and, 65
Integral kinematics
arm movements and, 148
Intensity gradients

visual motion measurement and, 14
Inverse kinematics
arm movements and, 148
Invertebrate nervous system
histamine in, 235-40
Invertebrates
learning in, 435-76
In vitro nuclear transcription run-off, 279
Iodine-125
autoradiography and, 44-45
Ion channels
acetylcholine receptor and, 405-6
olfactory transduction and, 349
Ipsilateral retinocollicular projection
superior colliculus and, 187-88
Isobutylmethylxanthine
rod outer segment and, 97

K

Kainic acid receptors
in vitro labeling autoradiography and, 37
Kassinin, 285

L

Laminin
basal flattening and, 324
receptor
transmembrane liganding function of, 324
Schwann cell basal lamina and, 313-14
Schwann cell secretion of, 309-11, 317
Lateral geniculate nucleus
color-selective cells in, 20
eye-input segregation in, 193
eye-specific layers in formation of, 191-94
retinal ganglion cell axons and, 172, 183
retinal ganglion cells and, 172-75
retinal projections to development of, 189-90
zero crossings and, 6, 9
Lateral orbitofrontal cortex, 371
Learning
associative, 437
invertebrate, 435-76
nonassociative, 437
Lectins
olfactory response and, 344, 347
Leumorphin
cloning of, 286
LGN
see Lateral geniculate nucleus
LHRH
see Luteinizing hormone releasing hormone
Lightness perception, 18-21
retinex theory and, 18-19
Limax maximus
learning in, 443-46
Linalool
Bombyx mori olfactory receptors and, 139
ß-Lipotropin
proopiomelanocortin precursor and, 281
Lipoxygenase
inhibitors of
cyclic GMP formation and, 225
Lithium
opioid peptide precursor synthesis and, 296
Locus coeruleus
striatum and, 373
Lumirhodopsin
formation of, 103
Luteinizing hormone releasing hormone
electrophysiological effect of, 418
enzymatic inactivation of, 426-29
precursor for, 286
Lymantria dispar antennae
disparlure metabolism on, 128
Lymnaea stagnalis
learning in, 448
Lymnaea stagnalis L
histamine synthesis in, 239
Lysophosphatidyl choline
acetylcholine receptor and, 386

M

Mammalian brain
histamine turnover in, 211-14
histaminergic pathways in, 227-30
Mammalian neurons
histamine and, 230-35
Mammalian visual system
development of, 171-202
Manduca sexta
histamine levels in, 239
Mast cells
histamine in brain and, 213
histamine metabolism and, 212
peripheral nerve bundles and, 214
Medial intralaminar nucleus
retinal cell ganglion axons and, 183
Melanocyte-stimulating hormone
proopiomelanocortin precursor and, 281
Mersalyl
olfactory response and, 344
Mesencephalic tegmentum
dopaminergic nuclei of basal ganglia circuits and, 373
Messenger RNA
see mRNA
Metalloendopeptidases
enkephalin inactivation and, 424-25
Metarhodopsin I
formation of, 103
Metarhodopsin II
formation of, 103
Methacrylate
autoradiography and, 42
Methamphetamine
histamine antagonists and, 220
Methylhistamine
deamination of, 211-12
EC-50 values of, 216
Methylimidazoleacetic acid
histamine deamination and, 211-12
Metiamide
histamine-induced excitations and, 231
Midbrain
CGRP mRNA in, 285
Monoamine oxidase
autoradiography and, 50
histamine turnover in brain and, 212
Monoamine oxidase B
methylhistamine deamination and, 211-12
Monoclonal antibodies
olfactory sensory neurons and, 347
Motoneurons
feeding behavior and, 445
Motor cortex, 362-68
mRNA
calcitonin, 284-85
cDNA preparation and, 278
cloning and, 278
distribution in cloned neuropeptides, 280, 282
Drosophila
cDNA clones from, 268-69
hybridization analysis of, 278
in situ hybridization and, 278-79
neuropeptide precursors and, 277

opioid peptide
brain distribution of, 294
preprotachykinin, 285
substance P
cloning and sequencing of, 285
MSH
see Melanocyte-stimulating hormone
Multiscale image analysis
visual cortex and, 10-11
Muscarinic cholinergic receptors
in vitro labeling autoradiography and, 35
in vivo labeling autoradiography and, 33
olfactory epithelial tissue and, 334
positron emission tomography and, 47
Muscarinic receptors
astemizole and, 219
cimetidine and, 220
histamine antagonists and, 219
Muscimol
GABA receptors and, 30
Muscle
activation of
aimed arm movements and, 147-49
Drosophila
ionic channels in, 257
Myasthenia gravis
nicotinic acetylcholine receptors and, 384
Myenteric plexus
histamine and, 233
Myxoviruses
epithelial cell polarization and, 322

N

Narcine spp.
acetylcholine receptor of, 389
Neocortex
Alzheimer's disease and, 494-95
Nerve
Drosophila
ionic channels in, 257
Neuroblastoma cells
cyclic GMP formation in
histamine receptors and, 223
Neuroendocrine peptides
regulation of, 277, 291
Neurofibrillary tangles
Alzheimer's disease and, 495-97
Neurokinin α, 286
Neurolipomastocytoid cells
in brain, 213
Neuromuscular junction
postsynaptic membrane of, 384-86
Neuronal recording
aimed arm movements and, 163-66
Neurons
brain information processing and, 280
eye field, 368-69
neuropeptide-containing
regulation of, 294
neuropeptide co-synthesis in, 279
Neuropathology
receptor mapping and, 29
Neuropeptides, 277-98
co-synthesis of, 279
diversity of
mechanisms generating, 280-87
enzymatic inactivation of, 419-29
gene conversion and, 284
gene families and, 283-84
genomic changes and, 281-83
hybridization and, 278-79, 287-97
mRNA and peptide distribution in, 280, 282
peptidases and, 416-19
polyproteins and, 286-87
RNA splicing and, 284-86
uptake of, 430-31
Neurophysins, 284
Neurosciences
computational vision and, 24-25
Neurotensin
enkephalin inactivation and, 425
metalloendopeptidases and, 425
receptors
in vitro labeling autoradiography and, 38
Neurotoxins
histidine decarboxylase and, 227
Neurotransmitters
distribution of, 29
olfactory, 334
receptors
binding ligands for, 31
mapping of, 27-50
Nicotine
enkephalin and, 293
Nicotinic acetylcholine receptors
myasthenia gravis and, 384
Nicotinic cholinergic receptors
in vitro labeling autoradiography and, 35
in vivo labeling autoradiography and, 33
Nicotinic receptors
enkephalin release and, 293
NMR spectroscopy
see Nuclear magnetic resonance spectroscopy
Nonassociative learning, 437
Noradrenaline uptake
autoradiography and, 50
Norepinephrine
histamine antagonists and, 219-20
histidine decarboxylase and, 227
invertebrate photoreceptors and, 456
Northern blot, 278
Nuclear magnetic resonance spectroscopy
brain metabolism and, 61-83
carbon studies, 69-72
heteronuclear decoupling and, 79-80
homonuclear decoupling and, 76-78
hydrogen studies, 72-76
magnetization transfer experiments and, 67-68
phosphorus studies, 63-69
selective excitation and, 80-82
Nucleus tractus solitarius
cell bodies in, 278

O

Oculomotor circuit, 368-69
Odorants
binding of, 343-45
Odors
primary, 339
Olfactory cilia, 332
receptors in, 346-47
Olfactory epithelia
cultures of, 347
receptors in, 334
structure of, 330-32
Olfactory marker protein, 347
Olfactory organs
insect, 122-26
stimulus transport and, 124-26
Olfactory receptors
insect
chemo-electrical transduction in, 121-40
intensity coding and, 136-38
proteins, 342-43
vertebrate, 329-50
biochemistry of, 342-49
electrophysiology of, 332-34

identification of, 345-46
qualitative parameters of, 339-42
quantitative parameters of, 334-39
Olfactory sensilla
see Sensilla
Oligopeptides
peptidases and, 426
Onchidium verruculatum
histamine in, 240
Operant conditioning, 468-69
Operant learning, 437
Opiate receptors
in vitro labeling autoradiography and, 36-37
in vivo labeling autoradiography and, 33
Opiates
actions of
receptor mapping and, 28
distribution of markers for, 367
physiologic effects of, 28
Opioid peptides
enzymatic inactivation of, 419-26
families of, 281
precursor mRNAs for
brain distribution of, 294
precursors of
gene sequencing and, 283
lithium and, 296
synthesis in brain, 294-97
Optic ataxia
aimed arm movements and, 161-63
Optic nerve
axons of
prenatal elimination of, 198-99
topographic ordering in, 186
Orbitofrontal cortex
lateral, 371
Overshadowing, 439
Oxytocin
carrier proteins of, 284
metalloendopeptidases and, 425
receptors
in vitro labeling autoradiography and, 38

P

Pallidum
striatal projection neurons in, 368
Panulirus interruptus
histamine in, 239
Para-chlormercuribenzoate
acetylcholine receptor and, 397
Paracerebral neurons
feeding behavior and, 447-48
Parallelism
visual attention and, 21-22
Paralysis
aimed arm movements and, 161
Paresis
aimed arm movements and, 161
Pargyline
histamine turnover in brain and, 212
Parietal lobe syndromes
aimed arm movements and, 161-62
Parkinson's disease
aimed arm movements and, 150
basal ganglia circuits and, 373-74
Pattern recognition
multiscale computations and, 10
Pedunculopontine nucleus
basal ganglia circuits and, 373
Peptidases
neuropeptides and, 416-19
oligopeptide hydrolysis and, 426
Peptides
bombesin-gastrin-releasing, 283-84
brain, 277
calcitonin gene-related, 285
cloned precursors of, 280, 282
prodynorphin, 281-83
see also Enkephalin, Neuroendocrine peptides, Opioid peptides
Perception
see specific type
Perceptrons, 21
Periarcuate nucleus
cell bodies in, 278
Peripheral nerve
Schwann cells and, 305
Peripheral nerve bundles
mast cells in, 214
Peripheral nervous system
nonneuronal cell ensheathment in, 320-21
Peripheral vision
aimed arm movements and, 158
Periphlaneta americana
histamine levels in, 239
Perirhinal cortex
ventral striatum and, 372
Pertussis toxin
transducin and, 110-11
PET scanning
see Positron emission tomography
Phencyclidine
acetylcholine receptor and, 398-99
Phenothiazines
schizophrenia and, 211
Pheromone-binding protein, 127
Pheromone-degrading enzymes, 127-128
Pheromones, 121, 334
half life of, 129
inactivation of, 128-30
olfactory sensillum and, 122
Phormia regina
associative learning in, 470
Phosphatidic acid
acetylcholine receptor and, 386
Phosphatidyl ethanolamine
acetylcholine receptor and, 386
Phosphatidyl serine
acetylcholine receptor and, 386
Phosphocreatine
brain metabolism and, 63-68
Phosphodiesterase
rod outer segment and, 98-99
Phosphoinositides
vision and, 113-14
Phospholipid metabolism
histamine agonists and, 225-26
Phosphorus
nuclear magnetic resonance spectroscopy and, 63-69
spectra, 77
Phosphorylation
olfactory transduction and, 349
photoexcited rhodopsin and, 101
Phototaxis
invertebrate
associative learning and, 452-54
Physostigmine
histamine antagonists and, 219
Picrotoxin receptors
in vitro labeling autoradiography and, 37
Pilocarpine
histamine antagonists and, 219
Pituitary
DNA hybridization and, 290-92
Plasma membrane
Schwann cell
myelin sheath formation and, 305

Pleurobranchae californica
learning in, 446-48
Polyproteins
DNA sequencing and, 279
neuropeptides and, 286-87
POMC
see Proopiomelanocortin
Positron emission tomography
receptor mapping and, 32, 46-47
Postsynaptic membrane
organization of, 384-86
Potassium channels
Drosophila mutants and, 260-67
molecular analysis of, 256
Potassium cyanide
cerebral acidosis and, 66
Precommissural pallidum
ventral striatum and, 372
Prefrontal cortex
dorsolateral, 369-71
Preprotachykinin
mRNA of, 285
neuronal synthesis of, 279
Primal sketch
visual processing and, 4
PRL
see Prolactin
Procollagen
Schwann cell basal lamina and, 313
Procorticotropin-releasing factor
sequences for, 286
Prodynorphin
mRNA of
brain distribution of, 294
peptides of, 281-83
Proenkephalin
adrenal synthesis of, 293
neuropeptide expression and, 279
sequence of, 281
Progesterone
luteinizing hormone releasing hormone and, 428-29
Proglucagon
cloned sequence of, 286
Progrowth hormone releasing factor
sequences for, 286
Proinsulin
transfection and, 279
Prolactin
diketopiperazine and, 429-30
genes for
pituitary and, 290-91
sequence homology of, 283
Proluteinizing hormone releasing hormone
sequences for, 286
Promethazine
histamine-induced excitations and, 231
Proopiomelanocortin
cloning and sequencing of, 281
gene for
pituitary and, 290-92
hypothalamic cell bodies and, 278
mRNA of
brain distibution of, 294
haloperidol and, 296
neuropeptide expression and, 279
Propantheline derivatives
histamine receptors and, 218
Protein kinase
olfactory transduction and, 349
Protein kinase C
activation of, 225-26
autoradiography and, 50
Proteins
brain-specific
identification of, 287-89
olfactory marker, 347
olfactory receptor, 342-43
phosphorylation of
olfactory transduction and, 349
Provasoactive intestinal peptide
PHM-27 in, 286
Psychological refractory period
aimed arm movements and, 159-60
Psychoses
treatment of
histamine and, 211
Puromycin
neuropeptide inactivation and, 420-22
Putamen
corticostriate projections to, 362
neuronal activity in, 365-66
neuronal clustering in, 367
2-Pyridylethylamine
histamine-induced excitations and, 231
histamine receptors and, 217
Pyrilamine
arachidonate release and, 225
cyclic GMP formation and, 225
histamine binding sites and, 221
histamine-induced depolarizations and, 237
histamine-induced excitations and, 231
histamine receptors and, 219

Q

Quinacrine
arachidonate release and, 225
cyclic GMP formation and, 225
Quinacrine mustard
acetylcholine receptor and, 400

R

Rabbit brain
carbon-13 spectra of, 71
Radioimmunoassay
neuropeptides and, 297
Ranitidine
physiologic effects of, 221
Rat brain
phosphorus spectra of, 77
proton spectra of, 73, 75, 77
Reaction time
aimed arm movements and, 158-61
Receptor lymph, 122
Receptor mapping, 27-50
chemical organization of brain and, 28-29
drug action and, 28
electron microscopic autoradiography and, 47-48
films used in, 42
immunohistochemistry and, 45-46
neuropathology and, 29
positron emission tomography and, 32, 46-47
Receptors
distribution of, 29
see also specific type
Reserpine
brain catecholamines and, 295
Resonance Raman spectroscopy
acetylcholine receptor and, 387
Reticulospinal tract
aimed arm movements and, 166
Retina
color-selective cells in, 20
cyclic GMP and, 95
growth of, 179-81
neurogenesis in, 177
parallelism and, 21
receptive fields of, 3
rod cells of
properties of, 87
structure of, 87-88
Retinal ganglion cells, 3, 21
adult organization of, 172-75
axons of
binocular competition and, 194-99

competition of, 201
eye-specific segregation of, 188-94
interactions of, 199-202
termination of, 172
central-to-peripheral gradient and, 176-81
dendrites of
competition of, 201
genesis of, 175-76
maturation of, 181-85
projections of, 172-73
topographic ordering of, 185-88
visual system development and, 171-202
Retinex theory
color perception and, 19-21
lightness perception and, 18-19
Retinocollicular projection
superior colliculus and, 187-88
Retinogeniculate axons
eye-input segregation and, 192
Retinogeniculate projection
development of, 189
synapses and, 193
Retinogeniculate system
adult organization of, 172-75
connections in development of, 175-202
eye-input segregation in, 194-99
Reverse transcriptase
cDNA preparation and, 278
Rhabdoviruses
epithelial cell polarization and, 322
Rhodopsin
evolutionary conservation of, 100-3
photoisomerization of, 103
rod outer segments and, 88, 98-99
structure of, 100-3
Rhodopsin kinase
cyclic GMP cascade and, 108-10
Rhodopsin noise, 91
RNA
Alzheimer's disease and, 502
RNA splicing
differential, 284-86
neuropeptides and, 277, 284-86
RNA viruses
epithelial cell polarization and, 322
Rubrospinal tract
aimed arm movements and, 166

S

Schistocerca americana gregaria
histamine levels in, 239
learning in, 450-52
Schizophrenia
phenothiazines and, 211
Schwann cells, 305-25
basal lamina of, 313-14
deficiencies in, 318-20
ensheathment deficiencies in, 318-20
extracellular matrix and, 314-21
deficits in, 320-21
myelin sheath formation and, 305
olfactory axons and, 331
polarization in, 321-24
secretory products of, 306-14
Scrapie, 503
Second-order conditioning, 438
Senile plaques
Alzheimer's disease and, 497
amyloid in, 498-99
Sensilla
insect, 122-23
electrical circuit of, 131-32
properties of, 132-33
transduction in, 135
voltage sources in, 133-34
Sensillum liquor, 122
Sensillum lymph, 122
ionic conditions of, 134
pheromone-binding protein in, 127
Sensitization
A. californica, 459-63
Sensory neurons
olfactory
electrophysiology of, 334
markers of, 347
Serotonin
A. californica and, 461
invertebrate photoreceptors and, 455-56
receptors
aging process and, 47
in vitro labeling autoradiography and, 35-36
in vivo labeling autoradiography and, 33
uptake sites of
autoradiography and, 50
Shoulder joint
aimed arm movements and, 147, 152
Sleep
histamine and, 211
Snake toxins
acetylcholine receptor and, 395-96
Sodium channels
cyclic GMP and, 90-94
molecular analysis of, 256
rod outer segments and, 89
Solution hybridization, 278
Somatosensory cortex, 362-68
Somatostatin
Alzheimer's disease and, 494
in hippocampus, 278-79
receptors
in vitro labeling autoradiography and, 38
Southern blot, 278
Spatial frequency
human vision and, 9-11
Sphingomyelin
acetylcholine receptor and, 386
Spinal cord
histaminergic fibers in, 209-10
prodynorphin mRNA in, 294
Splanchnic nerve
enkephalin release and, 293
Status epilepticus
bicuculline-induced, 66
brain metabolism and, 65
Stereopsis
multiscale computations and, 10
Stereo vision
computational analysis of, 2
Stimulus selection, 441
Striatum
projections to, 372-73
Suberyldicholine
acetylcholine receptor and, 393
Substance K, 285-86
receptors
in vitro labeling autoradiography and, 38
Substance P
distribution of markers for, 367
enkephalin inactivation and, 425
olfactory sensory neurons and, 334
precursor mRNA of, 285
receptors
in vitro labeling autoradiography and, 38
Substantia nigra
putamen input to, 363
striatal projection neurons in, 368
ventral striatum and, 372
Substantia nigra pars reticulata
motor cortex and, 363
Subthalamic nucleus
subsidiary basal ganglia circuits and, 373

Succinylcholine
nicotinic acetylcholine receptors and, 384
Sulfomucopolysaccharides
in brain, 213-14
Superior colliculus
retinal ganglion cells and, 172-73, 183
retinocollicular projection and, 187-89
saccadic eye movements and, 369
Surface orientation
multiscale computations and, 10
Synapses
retinogeniculate projection and, 193
Synaptic transmission
brain function diversity and, 280
Synaptosomes
histamine and, 209

T

Tectospinal tract
aimed arm movements and, 166
Tetraethylammonium ion
potassium channels and, 256
Tetrodotoxin
eye-input segregation and, 196
ionic channels and, 256
Thalamic reticular complex
selective visual attention and, 22
Thalamus
histamine levels in, 213
intralaminar nuclei of basal ganglia circuits and, 373
retinal ganglion cells and, 172
Thecogen cells, 122
Thermal regulation
histamine and, 211
Thermolysin
enkephalin inactivation and, 424-25
2-Thiazolylethylamine
histamine-induced excitations and, 231
Thyrotropin-releasing hormone
enzymatic inactivation of, 429-30
prolactin and, 290
receptors
in vitro labeling autoradiography and, 38
Tight junctions
cell polarization and, 321-22
Tiotidine
histamine receptors and, 216
Tormogen cells, 122
Torpedo californica
acetylcholine receptor of, 401-2
electrolyte lipids of, 386
neuromuscular junction of, 384-86
Torpedo marmorata
acetylcholine receptor of, 401
electrolyte lipids of, 386
Torpedo spp.
acetylcholine receptor of, 389
Torque
aimed arm movements and, 147-48, 154
Toxins
Alzheimer's disease and, 504
Transcription
in vitro nuclear transcription run-off and, 279
Transducin
adenylate cyclase cascade and, 110
cyclic GMP phosphodiesterase and, 107-8
kinetics and energetics of, 105-7
rod outer segment and, 98-99
signal-coupling proteins and, 110-12
visual transduction and, 103-5
Transduction
olfactory, 347-49
Transfection, 279
Trauma
Alzheimer's disease and, 504
Tremorine
histamine antagonists and, 219
TRH
see Thyrotropin-releasing hormone
Trichogen cells, 122
Trichoplusia ni
dodecenyl acetate and, 128
Trigeminal nucleus
CGRP mRNA in, 285
Tritium
autoradiography and, 42-45
Tryptamine
histamine antagonists and, 219
Tyrosine hydroxylase
cyclic AMP and, 293
Tyrosine residues
olfactory response and, 344

V

Vasoactive intestinal peptide
precursor for, 286
receptors
in vitro labeling autoradiography and, 38
Vasopressin
carrier proteins of, 284
receptors
in vitro labeling autoradiography and, 38
Vasopressin-neurophysin
regulation in brain, 296
Ventral pallidum
ventral striatum and, 372
Ventral striatum
cortical input to, 372
Vertebrate olfactory epithelium
structure of, 330-32
Vertebrate olfactory receptors, 329-50
biochemistry of, 342-49
identification of, 345-46
qualitative parameters of, 339-42
quantitative parameters of, 334-39
Vesicular stomatitis virus
epithelial cell polarization and, 322
Viruses
epithelial cell polarization and, 322
Vision
aimed arm movements and, 156-58
computational, 23-25
correspondence process and, 16-17
cyclic GMP and, 87-114
lightness perception and, 18-21
phosphoinositides and, 113-14
research in, 23-24
spatial frequency channels and, 9-11
stereo, 2
three-dimensional structure and, 17-18
see also Peripheral vision
Visual attention, 21-22
parallelism and, 21-22
sequential processing and, 22
Visual cortex
color-selective cells in, 20
multiscale image analysis and, 10-11
parallelism and, 21
spatial frequency tuning in, 9
zero crossings and, 3-9
Visual feedback
aimed arm movements and, 157-58
Visual motion
analysis of, 11-18
aperture problem and, 14-15
measurement of, 12-17
three-dimensional structure and, 17-18

Visual perception
artificial intelligence and, 1-25
Visual processing
first stage of, 4
Visual systems
mammalian
development of, 171-202

W

Wakefulness
histamine and, 211
Wheat germ agglutinin
olfactory response and, 344
Wrist joint
aimed arm movements and, 147, 152

X

Xenopus laevis
PE gene of, 281

Z

Zero crossings
detector, 8-9, 24
visual cortex and, 3-9